

Gas Stoichiometry Practice Sheet

- 1) For the reaction $2 \text{H}_{2(g)} + \text{O}_{2(g)} \rightarrow 2 \text{H}_2\text{O}_{(g)}$, how many liters of water can be made from 5 L of oxygen gas and an excess of hydrogen?

- 2) How many liters of water can be made from 55 grams of oxygen gas and an excess of hydrogen at STP?

- 3) How many liters of water can be made from 55 grams of oxygen gas and an excess of hydrogen at a pressure of 12.4 atm and a temperature of 85°C ?

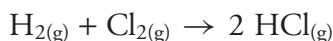
- 4) How many liters of water can be made from 34 grams of oxygen gas and 6.0 grams of hydrogen gas at STP? What is the limiting reactant for this reaction?

Skill Builder**Chapter 12****BLM 12-5****Gas Stoichiometry Problems****Goal**

Gas stoichiometry problems involve working with gaseous substances where volume data is given or required for a chemical reaction. This sheet deals with the steps necessary in solving three types of gas stoichiometry problems.

Mole-Volume

What volume of hydrogen would be required to produce 0.400 mole of HCl at 35°C and 0.965 atm?



Step 1: Using the moles of HCl_(g), determine the mol of H_{2(g)} required.

Step 2: Convert moles of H_{2(g)} to volume using the Ideal Gas Law.

Mass-Volume

When 10.7 g of Al are reacted with excess HCl, what volume of HCl will be produced at 47°C and 725 mm Hg?



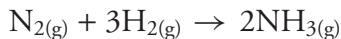
Step 1: Convert grams of Al to moles.

Step 2: Convert moles of Al to moles of H₂.

Step 3: Convert moles of H₂ to volume using the reaction conditions and the ideal gas law.

Volume-Volume

What volume of nitrogen at 215°C and 4.56 atm would be required to produce 55 L of ammonia?



Step 1: Since the conditions of temperature and pressure are not changing, use the balanced equation to determine a volume:volume ratio between NH_{3(g)} and N_{2(g)}.